

Orion versus Poseidon: Understanding How NASA's Crewed Capsule Survives Nature's Fury

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This presentation summarizes the Marshall Space Flight Center Natural Environments Terrestrial and Planetary Environments (TPE) Team support to the NASA Orion space vehicle. The Orion vehicle, part of the Multi-Purpose Crew Vehicle Program, is designed to carry astronauts beyond low-Earth orbit and is currently undergoing a series of tests including Exploration Flight Test (EFT) - 1. This design must address the natural environment to which the capsule and launch vehicle are exposed during all mission phases. In addition, the design must, to the best extent possible, implement the same process and data to be utilized on launch day. The TPE utilizes meteorological data to assess the sensitivities of the vehicle due to the terrestrial environment. The presentation describes examples of TPE support for vehicle design and several tests, as well as support for EFT-1 and planning for upcoming Exploration Missions while emphasizing the importance of accounting for the natural environment's impact to the vehicle early in the vehicle's program.